

WHAT IS CLAIMED IS:

1. A conveying system for conveying and selectively diverting articles, comprising:

5 a conveyor for conveying articles in a longitudinally downstream direction, the conveyor having a conveying surface defining a longitudinal edge; and

10 a diverter blade arranged to be rotated about a generally vertical rotary axis from a retracted position along the longitudinal edge of the conveying surface to an extended position across the conveying surface to displace an article;

15 the diverter blade forming a pusher portion defining a pusher surface spaced downstream of the rotary axis;

the diverter blade having a void arranged between the rotary axis and the pusher portion for enabling a subsequent article to pass downstream of the axis without contacting the diverter blade while the diverter blade is in an extended position.

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2. A conveying system according to claim 1, wherein the pusher surface is spaced apart from the rotary axis in a direction of conveyance by a distance of at least 1/4 of a length of the pusher surface.

25 3. A conveying system according to claim 2 wherein the distance is at least 1/2 of the length of the pusher surface.

4. A conveying system according to claim 2, wherein the distance is at least $2/3$ of the length of the pusher surface.

5 5. A conveying system according to claim 1, further comprising a torque-transmitting member connected to the diverter blade for rotating the diverter blade.

10 6. A conveying system according to claim 1, wherein the pusher portion is connected to the axis by a connection portion, an intersection of the connecting portion and the pusher surface forming a step.

7. A conveying system according to claim 1, wherein the pusher surface is planar.

15 8. A conveying system according to claim 1, wherein the pusher surface is curved as viewed in a vertically downward direction.

20 9. A conveying system according to claim 1 wherein the pusher portion is connected to the axis by a connecting portion, the pusher portion being pivotably mounted to the connecting portion, and a shock absorbing mechanism connected between the pusher portion and the connecting portion.

25 10. The conveying system according to claim 9 wherein the pusher surface is elastic to absorb shock.

11. The conveying system according to claim 1 wherein the pusher surface is elastic to absorb shock.

12. A conveying system according to claim 1, wherein the connecting portion having a connector surface facing the conveyor edge, the pusher surface being positioned closer to the conveyor than is the connector surface, in the retracted position of the diverter blade.

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13. A conveying system for conveying and selectively diverting articles, comprising:

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a conveyor for conveying articles in a longitudinally downstream direction, the conveyor having a conveying surface defining a longitudinal edge; and

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a diverter blade arranged to be rotated about a generally vertical rotary axis from a retracted position along the longitudinal edge of the conveying surface to an extended position across the conveying surface to displace an article,

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the diverter blade having a pusher portion defining a pusher surface spaced downstream of the rotary axis by a connecting portion of the diverter blade,

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wherein a section of the connecting portion disposed immediately downstream of the rotary axis extends in a direction away from the edge of the conveying surface in the retracted position of the diverter blade, wherein the section avoids contact with a subsequent article while the diverter blade is in an extended position.

14. A diverter blade for displacing articles from a conveying surface, comprising:

a rear mounting portion;

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a front pusher portion defining a planar pusher surface; and

a connecting portion interconnecting the mounting portion and the pusher portion;

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wherein a rear section of the connecting portion disposed immediately forward of the mounting portion extends in a direction offset from the pusher surface to form a void.

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15. A diverter blade according to claim 14, wherein an intersection of the connecting portion and the pusher surface forms a step.

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16. A diverter blade according to claim 14 wherein the pusher portion is connected to the connecting portion by a pivot, and a shock absorbing mechanism is connected between the pusher portion and the connecting portion.

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17. A diverter blade according to claim 16 wherein the pusher surface is formed of an elastic material to absorb shock.

18. A diverter blade according to claim 14 wherein the pusher surface is formed of an elastic material to absorb shock.

19. A diverter blade according to claim 14 further including a rotary axle at the rear mounting portion.

5 20. A method of selectively diverting articles from a conveyor by a diverter blade positioned next to a longitudinal edge of the conveyor, the blade including a pusher portion arranged to move across the conveyor between retracted and fully extended positions in response to a pivoting of the diverter blade about a generally vertical axis, the axis being spaced from the pusher portion in a direction opposite a longitudinal direction of article
10 conveyance, the method comprising the steps of:

A) conveying the articles in a longitudinal downstream direction, with a side of the articles disposed adjacent the longitudinal edge of the conveyor, and with a first of the articles spaced downstream of a
15 second of the articles;

B) maintaining the diverter blade in the retracted position until the first article reaches a position adjacent the pusher portion of the retracted diverter blade; then
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C) pivoting the diverter blade from the retracted position to the fully extended position to cause the pusher portion to push the first article from the conveyor; then

25 D) pivoting the diverter blade from the fully extended position to the retracted position; and

5 E) causing the second article to pass downstream of the pivot axis and into a void formed by the diverter blade prior to the diverting blade reaching the retracted position during steps C and D, to avoid contact between the trailing article and the diverter blade.

10 21. The method according to claim 20, wherein the diverter blade travels from the retracted position to the fully extended position and then back to the retracted position in a cycle time, and the conveyor travels at a conveying speed, wherein a spacing between the first and second articles during step A is shorter than the cycle time multiplied by the conveying speed.

15 22. A diverter blade for diverting articles from a conveyor, comprising a rear connecting portion, and a front pusher portion mounted to the connecting portion by a pivot, and a shock-absorbing mechanism connected between the pusher portion and the connecting portion.

20 23. The diverter blade according to claim 19 wherein the shock absorbing mechanism comprises a spring and a damper.

24. The diverter blade according to claim 22 wherein the pusher portion is formed of an elastic material to absorb shock.